

GENETIC RECOMBINATION IN ESCHERICHIA COLI.

By Joshua Lederberg

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ABSTRACT

Wild type or "prototroph" cells were found in a proportion ca. 10^{-6} in mixed cultures of biochemical mutants of E. coli. It could be shown that these did not result from spontaneous back-mutation. In addition to wild types, other recombination types were found suggesting the occurrence of a sexual process in E. coli. The analysis of the segregation of factors for lactose fermentation and for resistance to bacteriophage led to the conclusion that a single linkage group was present, on which eight factors have been mapped.

Experiments confirming the linear order of genes, and biparental inheritance were performed. It was concluded that E. coli is normally haploid and that it undergoes sexual fusion with immediate reduction-division, during which crossing-over takes place. The alternative explanation that the apparent recombinations are due to soluble transforming factors is discussed in detail and shown to be uneconomical. Due to the rarity of the process cytological examination was unfeasible. Attempts to reveal recombination in two other strains of E. coli were unsuccessful, as were attempts to induce aberrations in the chromosomal arrangement or the ploidy of the species.

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